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HOSPITAL BUILDING NOTE

PATHOLOGY DEPARTMENT

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Pathology Department

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Appendix

An addendum to Appendix E of Hospital Building Note No. 2, *The Cost of Hospital Buildings*, which sets out cost recommendations for the Pathology Department is supplied with this Building Note.

I. Scope

This Building Note gives guidance on the design of pathology departments in district general hospitals. It also applies to the hospital work requirements of teaching hospitals: their requirements for research and teaching purposes will be dealt with separately.

Hospital post-mortem suites and animal houses should also be considered when pathology departments are being planned. Post-mortem rooms will be dealt with in the Building Note on mortuaries and animal houses in a separate Building Note.

The needs of the Public Health Laboratory Service also have to be borne in mind. It is now considered desirable for hospital and public health laboratories to be in the same building in which case some facilities can be shared. The extra accommodation needed for the public health laboratories is excluded from the scope of this note.

Sub-laboratories required for special departments, such as operating theatre suites, are also excluded.

II. General considerations

A pathology department is an essential and increasingly important part of a general hospital. The present tendency for the range and volume of its work to increase must be borne in mind when the building is being planned.

The department will receive for examination specimens taken from in-patients and out-patients of one or more hospitals and from the patients of general practitioners. Hospital specimens may come from the wards, the theatres, accident and emergency departments, out-patient departments and post-mortem rooms. Patients may come to the department for fresh specimens to be taken or for special diagnostic procedures. Work may also be referred to the department by local authorities.

The work of the department falls into four main sections:

(i) *Morbid anatomy and morbid histology*. The study of the effect of disease on the organs and tissues of the body.

(ii) *Chemical Pathology*. The study of chemical and bio-chemical processes in the human body.

(iii) *Haematology*. The study of blood and blood forming organs, including blood matching.

(iv) *Microbiology*. The study (morphological, cultural, serological and by inoculation) of micro-organisms (bacteria, protozoa, fungi, viruses) concerned in human disease.

At present the work falls almost entirely within these four main sections, but further developments which are at present largely research undertakings, such as bio-physics, clinical physiology and histochemistry, may in future become routine and require further laboratory space with or without reduction in one or more of the present sections.

Figure 1 illustrates the arrangement of the main divisions of a pathology department and their relation to the animal house and post-mortem room.

The gradual increase in the volume of work being carried out in pathology departments should receive consideration in the design and siting of a new department. Recent statistics show that the work load over the country as a whole has increased at a rate of about 10 per cent per annum. A sample of individual laboratories however reveals—in this instance for the year 1958–59—a range of increases, varying from 2 per cent to 20 per cent. The siting of the building in such a way that the perimeter can be extended, or an additional storey added, should therefore be considered.

The design of departments on modular principles should ensure that modifications can be simply made. This is particularly important in the design and positioning of engineering services. The use of fittings built up from dimensionally co-ordinated assemblies of work-tops and storage units should enable the layout to be rearranged with the minimum disturbance.

Work spaces should be carefully orientated: north light may be required for some, and good natural lighting is required in most laboratories. Blinds may be required for sun and light control.

The department should be conveniently accessible from the places referred to above from which it receives specimens. It is most desirable that the department should be conveniently placed for out-patients. If this is not possible a sub-laboratory may be needed in the out-patient department.

The department should be located so that bulk stores can be conveniently delivered and waste collected for disposal. The increasing use of disposable goods in the laboratory may affect the arrangements for the disposal of laboratory waste.

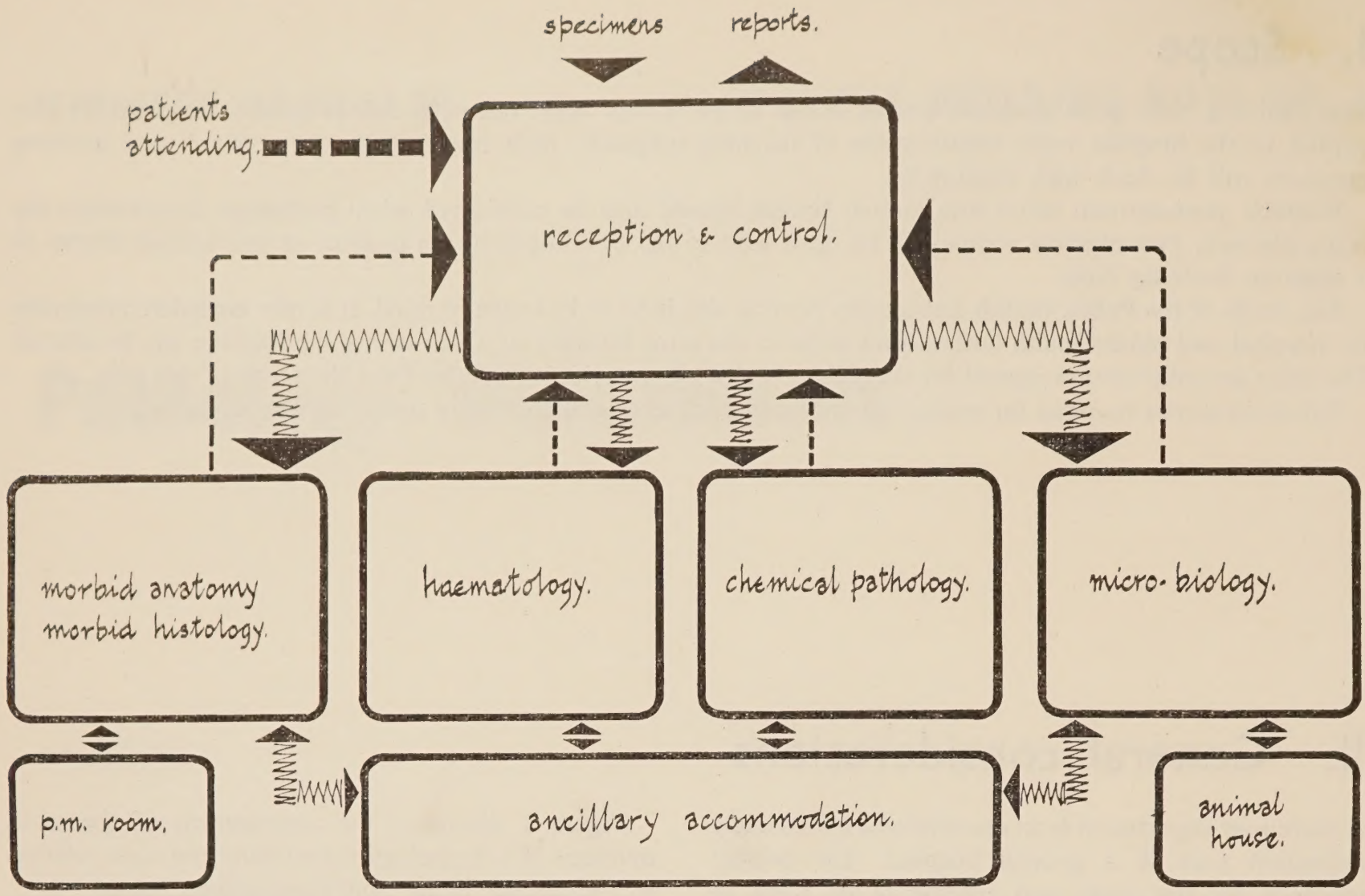

Figure 1.

Recommendations on the amount of bench space for each laboratory are not provided in this note. Technicians do not always work at personally allocated bench stations, but may need to use specialised equipment set up for particular groups of tests. The amount of benching required in each laboratory varies according to the particular tests to be carried out.

A pathology department may serve one or a group of hospitals. A full pathology service can most economically be provided for about 600 to 800 acute beds. This may be provided in the following manner:

(i) at one hospital of about that number of acute beds;

(ii) at one hospital serving a group of that number of acute beds; or

(iii) as a shared service provided at more than one hospital.

There are circumstances, however (e.g. in isolated areas), where a full service may have to be provided for less than this number—say for 400 acute beds. Very exceptionally, simple provision may have to be provided for even smaller hospitals which do not fit into any of these categories, but the service must then be linked to a larger unit to supplement its facilities.

The Appendix gives a table of areas recommended for the basic accommodation for a full pathological service arranged in each of the ways described in the last paragraph. It can be seen that, where a full service is provided, the amount of basic accommodation does not vary greatly with the number of beds. Similarly, a service provided for a hospital of more than 800 acute beds would not require any substantial increase in the basic accommodation.

III. List of rooms

A. Basic accommodation

(*a*) *Entrance*

(i) Patients' waiting room
(ii) Patients' lavatories
(iii) Patients' examination rooms
(iv) Clerical suite.

(*b*) *Administration*

(i) Pathologists' rooms
(ii) Registrar's room
(iii) Head technician's room.

(*c*) *Morbid anatomy and morbid histology division*

(i) General laboratory
(ii) Specimen cutting room
(iii) Cytodiagnosis room(s).

(*d*) *Chemical pathology division*

(i) General laboratory
(ii) Balance and instrument room
(iii) Chromatography room.

(*e*) *Haematology division*

(i) General laboratory
(ii) Transfusion laboratory
(iii) Blood bank.

(*f*) *Microbiology division*

(i) General laboratory
(ii) Virology laboratory
(iii) Serology laboratory
(iv) Media room
(v) Sterilising room
(vi) Plate preparation room.

(*g*) *Service rooms*

(i) Outfit preparation room
(ii) Centrifuge room
(iii) Workshop
(iv) Disposal room
(v) Stores
(vi) Wash up.

(*h*) *Staff rooms*

(i) Refreshment and rest room
(ii) Tea pantry
(iii) Cloakrooms and lavatories.

(*i*) *Cleaners' room*

(*j*) *Circulation space necessary for the above accommodation*

Functional unit

The functional units selected for the basic accommodation in this note and the related cost note (Appendix E to Building Note No. 2) are the departments set out in the Appendix.

B. Additional accommodation

Additional accommodation which may be required in some hospitals may include:

(*a*) Metabolic suite
(*b*) Tuberculosis laboratory
(*c*) Trace element laboratory
(*d*) Blood donors' room
(*e*) Photomicrography room(s)
(*f*) Isotope laboratories
(*g*) Research laboratories
(*h*) Hot room
(*i*) Cold room
(*j*) Museum
(*k*) Mounting and preparation room
(*l*) Incinerator room.

IV. Description of rooms

(*a*) *Entrance*

(i) *Patients' waiting room*

This should be near the entrance to the department.

(ii) *Patients' lavatories*

One w.c. and one lavatory basin for each sex.

(iii) *Patients' examination rooms*

Two or three rooms, each about 110 sq. ft. in area, where ambulant patients may be interviewed and blood or other specimens taken. Space should be allowed for a couch and desk, etc. Each room should have an adjacent cubicle fitted with a w.c. or clinette.

(iv) *Clerical suite*

This is for:

(*a*) reception of patients;
(*b*) reception, recording and distribution of specimens;
(*c*) general clerical work and storage of current records.

Specimens will be delivered to a hatch or counter (which should be in a position not visible to patients) and then collected for testing; a lavatory basin should be placed next to the specimen delivery and receiving hatch. About 80 sq. ft. for each clerk is recommended, the total area to be suitably sub-divided to meet the above needs.

(*b*) *Administration*

(i) *Pathologists' rooms*

These are required by the consultant pathologists in the various divisions for examining specimens, writing reports, etc. They should be adjacent to the division(s) which the pathologist supervises. They can be fitted as a combined office and laboratory, or these can be separately provided within the area indicated in the schedules.

(ii) *Registrar's room*

A room will be required where notes and records may be written up: it should contain a laboratory bench and table.

(iii) *Head technician's room*

A room will be required where the head technician will keep records, and arrange the ordering and issuing of stock and stores for the laboratories.

(*c*) *Morbid anatomy and morbid histology division*

This division is where specimens obtained from operation or post-mortem are prepared for macroscopical and microscopical examination. The specimens are usually kept in a fixative in small jars and are then examined and small portions selected for microscopic examination. These portions are cut out in the specimen cutting room, and taken into the main laboratory where they undergo further processing before sections are cut, mounted on slides, stained and examined under a microscope.

(i) *General laboratory*

In addition to work-tops, storage units and sinks, etc., special equipment such as CO_2 cylinders for freezing specimens, an automatic tissue processor, microtomes, paraffin wax ovens, and a knife sharpening machine may be required.

(ii) *Specimen-cutting room*

A separate room will be required with racks for specimens in jars in addition to work-tops and/or a special dissecting table and a sink. A waste disposal unit should be included, as well as an extract fan for removing formalin vapour.

(iii) *Cytodiagnosis room(s)*

While in the main, diagnosis in the histology division depends on the examination of tissues or organised collections of cells as found in the organs of the body, cytodiagnostic work (the microscopic examination of individual cells in discharges, scrapings or fluids of the body) involves special techniques for which a separate laboratory is required. This work is likely to be of increasing importance. The room should be equipped with work-tops, storage units, sinks, etc. Blackout facilities may be needed.

(*d*) *Chemical pathology division*

This division undertakes the chemical study of body fluids, excreta and occasionally tissues of the body, and sometimes examination of suspected poisons or other chemical substances. Meticulous care is required in weighing small quantities of chemicals and it is necessary to have a special room where very sensitive balances are kept. Automatic equipment is increasingly used for routine biochemical tests.

(i) *General laboratory*

This requires more work-top space than other laboratories because of the amount of special apparatus and equipment. Fume cupboards, centrifuges, drying ovens, refrigerators and stills, etc., are needed besides normal benching and reagent racks.

(ii) *Balance and instrument room*

Balances and special instruments are preferably kept and used in a separate room. A vibration-free bench is essential for these sensitive instruments. The siting of the room should have regard to the proximity of main roads, railways and other sources of vibration.

(iii) *Chromatography room*

Analysis by the separation of compounds is preferably carried out in a separate laboratory. Work-tops, storage units, and sinks will be required as well as a drying oven and extract ventilation.

(*e*) *Haematology division*

This division undertakes the study of the cellular elements of the blood, including counting of red and white cells, blood platelets and differential counts of white cells. Included in the work of the laboratory is estimation of coagulation time, the control of anti-coagulant therapy and bone marrow investigation.

(i) *General laboratory*

At present the study of the cellular composition of blood calls for a microscope bench for each technician, but the application of automatic processes already in being may modify this requirement in the future. Work-tops, storage units, sinks, centrifuges and a refrigerator are required.

(ii) *Transfusion laboratory*

A separate laboratory is needed for blood grouping, compatibility testing and other immunohaematological examinations. Facilities for preparing concentrated red cells and carrying out other sterile procedures may be necessary. Centrifuges, refrigeration (to provide temperatures of −20°C and +4°C), incubator, sink, work-tops and storage units are required.

(iii) *Blood bank*

The blood bank should be in this division. Blood is usually obtained at regular intervals from the Regional Blood Transfusion Service, kept in bottles, and either used or returned to the blood transfusion service. It should be kept in a free-standing refrigerator, specifically designed for the purpose or in a built-in cold room specifically allocated for blood and used only for this purpose. Each should operate at 4°C to 6°C and be equipped with suitable alarms and a temperature recording device. The blood bank should be so positioned that access to it can be effectively controlled by the pathologist-in-charge. It should be easily accessible at night.

(*f*) *Microbiology division*

This division undertakes the investigation of diseases due to micro-organisms which are classified biologically into filterable viruses, protozoa, bacteria and fungi. Separate provision should be made for viruses: occasionally separate provision is necessary for fungi, and in hospitals with much tropical disease, a separate section deals with protozoa. Infected fluids, blood, excretions and discharges, and occasionally tissues, are received for examination. Swabs from throat, nose and other areas, of the body are sent to this laboratory for culture. Control of infection in the hospital brings specimens of dust, air, and "sterile supplies" for examination. These specimens may be directly cultured on to culture media or examined microscopically with or without staining. Investigation of immune bodies in blood serum entails the mixing of the blood serum with known cultures of organisms, and this technique may be applied similarly for the investigation of particular types of organisms; a special branch of this work is the investigation of organisms in relation to the susceptibility or resistance to antibiotics. Because of the particular danger of infection to laboratory workers when tuberculous material is handled a special room may be required (see Additional accommodation, paragraph (*b*)).

(i) *General laboratory*

Work-tops, storage units, sinks, incubators, a refrigerator, deep freeze cabinet, water baths, and storage for media are required, together with facilities for the easy disposal of specimens. A safety cabinet with an exhaust fan will be required unless a separate laboratory as described in Additional accommodation, paragraph (*b*), is provided.

(ii) *Virology laboratory*

This room is for the identification of viruses in infected material and fluids. Various fittings are necessary according to whether the viruses are to be grown on culture media, eggs, or tissue cultures. Work-tops, storage units and sinks will be required.

(iii) *Serology laboratory*

This is for the examination of blood serum, more particularly in relation to its immune bodies. Work-tops, storage units, and sinks will be required.

(iv) *Media room*

This is required either for the preparation of media within the department, or for the storage of commercially prepared media. The recommended size includes a draught-free cubicle, for plate pouring, of about 50 sq. ft.

(v) *Sterilising room*

Autoclaves and a hot air steriliser are required for the special needs of this department, even where there is a central sterile supply department serving the hospital. A gas or electric wash boiler and a still may also be needed in addition to the still in the wash-up room.

(vi) *Plate preparation room*

In this room plates are prepared prior to sterilisation and pouring of media. Work-tops, storage units and sinks will be required.

Note.—These last three rooms should be en suite, opening into one another.

(*g*) *Service rooms*

(i) *Outfit preparation room*

For the assembly, labelling and general preparation of containers, etc., used for the collection of specimens.

(ii) *Centrifuge room*

For the isolation of certain centrifuges, on vibration free benching, away from sensitive laboratory instruments.

(iii) *Workshop*

This is needed for such purposes as the improvisation and maintenance of laboratory equipment. A strong work bench with a fitted vice, and a Belfast sink are usually required.

(iv) *Disposal room*

This is for the general collection of laboratory waste, disposable goods, stools and other specimens for disposal and should be well ventilated.

(v) *Stores*

Several stores will be required—for records, slides, wax blocks, specimens, poisons, etc.—distributed throughout the department. A main central store, fitted

with racks, is needed for glassware and other equipment. Stocks of inflammable liquids should be kept in an easily accessible fire-resisting store of about 50 sq. ft. outside the main building. The areas given in the Appendix for all stores should be sub-divided and allocated as required.

(vi) *Wash-up*

All used equipment will be cleaned here. Some of it may first require sterilising. Washing and rinsing sinks, draining racks and a drying cupboard or hot air oven are needed unless mechanical washers are used. A slop-hopper or waste disposal unit should be provided and a still is generally required.

(*h*) *Staff rooms*

(i) *Refreshment and rest room*

It is most important that the staff should not take food or drink in any part of the laboratory, where the risk of infection is considerable. It is therefore important to have a room for refreshments, which may also be used as a rest room. About 12 sq. ft. per person is needed.

(ii) *Tea pantry*

This should adjoin the rest room and be equipped with a ventilated cupboard, work-top, sink and gas or electric boiling top.

(iii) *Cloakrooms and lavatories*

Changing rooms with lockers are required for male and female staff. The staff lavatories should be planned with the cloakrooms.

(*i*) *Cleaners' room*

This should have a bucket sink, draining board, locker and space for brooms, buckets, mechanical equipment, etc. The room should be adequately ventilated.

(*j*) *Circulation space*

B. Additional accommodation

(*a*) *Metabolic suite*

A suite of rooms may be needed for basal metabolic rate estimations. Space will be required for two curtain-fronted cubicles of about 80 sq. ft. each, working space for the pathologist and a small day room and adjacent lavatory for patients having prolonged tests. An area of about 300 sq. ft. is recommended.

(*b*) *Tuberculosis laboratory*

A small laboratory may be needed associated with the microbiological laboratory. A safety cabinet with an exhaust fan is required and a wash basin with elbow action taps is essential. An area of not less than 140 sq. ft. is recommended.

(*c*) *Trace element laboratory*

A small laboratory of about 140 sq. ft. may be required for the isolation of trace elements and should be planned as part of the chemical pathology division. It should be free from any fumes from reagents, etc.

(*d*) *Blood donors' room*

A room near the blood bank may be needed for the taking of blood from fresh donors; it should be provided with at least one couch and a wash basin. Allow 100 sq. ft. per couch.

(*e*) *Photomicrography room(s)*

A photographic room and dark room may be needed for the photographing of specimens and slides. The photographic room should be about 80 sq. ft. and suitably darkened. The dark room should be about 90 sq. ft., with a long bench on one side of the room and a dry bench, wet bench and shallow sink for film and print washing tanks on the other. Processing is normally carried out in stainless steel or rubber tanks. Dishes for developing prints, a deep tank for washing negatives and a print washer are required. An enlarger may be needed on the dry bench.

(*f*) *Isotope laboratories*

If they are associated with this department, two rooms or more are generally required, each about 140–160 sq. ft. The modern tendency however, is to locate the isotope laboratories in a special unit. The disposal of radio-active effluent has specially to be considered.

(*g*) *Research laboratories*

The need for such laboratories, together with their size, fittings and equipment will depend on local circumstances.

(*h*) *Hot room*

When needed, this should be about 65 sq. ft. with ample shelving, an air lock, and a thermostatically controlled heating unit.

(*i*) *Cold room*

When needed, this should be about 65 sq. ft. with ample shelving, and air lock, and automatic cooling plant.

(*j*) *Museum*

This is occasionally needed; it will need to be at least 140 sq. ft.

(*k*) *Mounting and preparation room*

A room of about 100 sq. ft. may be required in association with the museum for the mounting and preparation for specimens.

(*l*) *Incinerator room*

Although laboratory waste may sometimes be disposed of in the main hospital incinerator, highly contagious matter should not be carried through other parts of the hospital. A local incinerator may therefore be desirable—easily accessible from the disposal room—and this might also serve the needs of the animal house. The size of the room will depend on the appliance required, and a suitable flue will need to be provided. About 60 sq. ft. is needed.

V. Engineering services

The range of equipment and procedures in use in pathological laboratories calls for a generous provision of mains services. It is important to design the engineering services in such a way that they can be easily extended and to allow easy access for routine maintenance.

The provision of meters for departmental costing purposes should be considered where these can be installed conveniently and inexpensively.

Mechanical services

Heating

Radiators are often difficult to accommodate in laboratories because the wall space is taken up by benches and cupboards. Placed behind benches they lose effectiveness and are inaccessible for cleaning. Bench space is lost by having grills above radiators, and cupboards alongside the radiators may become overheated.

For these reasons heating by means of ceiling panels is preferred. The design should be such that the radiant heating effect does not cause discomfort to staff; this applies particularly in rooms of less than 10 ft. in height and advice on this aspect may be found in the "Guide to Current Practice" of the Institution of Heating and Ventilating Engineers.

Space heating requirements should be calculated on the following recommended design temperatures and ventilation rates based on an outside air temperature of 30°F:

Accommodation	*Temperature*	*Air changes per hour*
Laboratories, pathologists', registrar's and head technician's rooms, *specimen-cutting room, cytodiagnosis room(s), balance and instrument room, *chromatography room, media room, preparation rooms, centrifuge room, metabolic suite, workshop and museum, patients' examination rooms, offices, staff rooms, blood donors' room waiting rooms and lavatories	65°F	2
†Sterilising room, †disposal room, †wash-up, cleaners' room, corridors and staircases	60°F	2
‡Photomicrography rooms	65°F	3
Equipment store	50°F	½

Ventilation

The department will usually be designed for natural ventilation and particular attention should be given to the type of window selected, to allow air infiltration without draught. Top opening windows at high level should be provided with a "minimum setting" notch or other adjustment to give control of the incoming air. In ceiling heated rooms the incoming air should not be directed at the ceiling.

* Simple mechanical extract ventilating in the specimen-cutting and chromatography rooms.

† Simple mechanical extract ventilation in the sterilising room, disposal room and wash-up.

‡ Simple mechanical extract ventilation.

Internal rooms will require to be mechanically ventilated.

Extract fans will be required in the wash-up, sterilising, chromatography and disposal rooms to reduce the nuisance from steam, heat and gaseous vapours.

Suitable ventilation for the larger photographic dark rooms can be provided by light proof inlet louvres at low level and an extract fan at high level, preferably on an opposite wall. The fan should be light proof and sited to avoid back pressure from wind. Small dark rooms can be ventilated naturally through louvres but will probably need airing at intervals: if this cannot be done, by opening a window, a small fan may be justified.

The specimen-cutting room should have an extract fan above the cutting bench to prevent excessive concentration of formalin vapour.

Tubercle bacilli cabinets and laboratory fume cupboards should have built-in exhaust fans and these should discharge to the open air away from all windows or ventilation openings.

Hot, cold and drinking water

These should normally be connected to the hospital's main services.

Laboratory type fittings will be required for laboratory sinks: normal pillar taps elsewhere. Particular care must be taken to ensure that the cold water supply to the dark room is clean and it may be necessary to provide a filter for the removal of scale, rust, etc.: the temperature must not exceed 65°F for film processing purposes.

A drinking water tap supplied from the incoming main will be required in the cloakrooms and tea pantry.

Water filter pumps should not be used.

Steam supply

A hospital's central steam supply provides an economical source of heat for stills and sterilisers and a steam service should therefore be provided in the laboratory. A mains pressure of 50 p.s.i. will cover all requirements and reducing valves can be used to suit the apparatus.

Purified and distilled water

Purified water may be obtained for laboratory purposes by distillation or de-ionisation, but the latter process may be uneconomic when the water supply is hard.

When a steam supply is not available, the stills may be either gas or electrically heated. They should be permanently connected to the source of heat.

Sterilising

A dry saturated steam supply is required for steam sterilisers with a generously sized service pipe to allow quick heating-up.

Hot air ovens are usually electrically heated.

Town gas

A gas supply will be required for all laboratories to serve gas points on benches and in fume cupboards.

Hot room

This will be a small, well-insulated room entered through an air lock large enough to accommodate a small, wheeled trolley. Heating is best provided by means of enclosed, low temperature, electric heaters, thermostatically controlled and shielded to prevent articles from being placed in contact with them. A ceiling mounted variable speed fan is desirable for circulation and the prevention of stratafication of the air. Alternatively, the room may be heated by a thermostatically-controlled, fan-assisted electric convector.

If there is no air lock, a warning light, operated by a door switch, should be placed over the hot room door to indicate if the door is not properly shut. The room temperature is normally kept at 37°C (blood heat).

Cold room

The refrigerating plant for the cold room should be housed in a well ventilated chamber and should be mounted on a raised brick or concrete plinth to facilitate servicing. This chamber may also accommodate the electrical switchgear and distribution boards, etc., and should preferably have direct external access for servicing and maintenance. The direct expansion cooling coils should have suitable drainage trays led to waste. The refrigerant should be non-toxic, e.g. Freon 12 or Arcton 6.

The construction and insulation of the cold room should ensure that the running time of the plant does not exceed 18 hours per day, with normal periods for doors opening. Door fastenings should be operable from the inside of the room as well as from outside. Where a circulating fan is used, it should be stopped by a door switch when the door is opened. A neon indicating lamp should indicate outside the room that the fan and compressor are working. Fittings in the room should be heavily galvanised; lighting fittings should also be water tight.

The normal operating temperature is 4°C and thermostatic control is required. If the cold room is used as a blood bank it should have an alarm to give warning if the temperature rises above 8°C. The alarm bell should be located at the telephone switchboard, or some other station that is manned continuously.

Suction and compressed air systems

One or both of these systems may be provided depending on local requirements. The taps should be carefully sited in relation to the sinks and other fixed equipment.

Fire alarm system

The hospital fire alarm system should cover the Pathology Department. The need for an automatic fire detection system should be considered, particularly in rooms which are not occupied at night or for long periods and which contain equipment constituting a special fire risk. Information on fire alarms and extinguishers is given in B.S. Codes of Practice and in H.M. (56) 36 on "Hospital Fire Precautions".

Advice on the fire fighting installation proposed should be sought from the local fire authority.

A free-standing flammable liquid store should be provided within easy access of the laboratories.

Electrical installation

General

The electrical installation will consist of general and special lighting, socket outlets and the wiring and equipment required for heating, ventilating, refrigerating and other installations such as telephones and clocks.

The position of the lighting fittings and electrical outlets in laboratories must be related to that of furniture, fittings and equipment, and must be decided during the early planning stages.

Supply and distribution

The electrical supply will normally be provided by sub-main circuits from the main intake and distribution centre. Where the sub-main and local distribution equipment is not placed in the refrigeration plant chamber, a switchroom must be provided. Additional distribution boards should be installed in dry and readily accessible places easily reached from a standing position. Some boards may need to be fitted with locks. Ample spare fuse-ways and fuses should be provided to meet the increasing use of electrical apparatus in this department. H.R.C. fuses are recommended.

Artificial lighting

General lighting should follow normal hospital practice. Tungsten lighting is generally suitable, but fluorescent lighting may be preferred where higher intensities are required for long periods. The stroboscopic effect of fluorescent lighting must be avoided where there is moving machinery, and specially selected fluorescent tubes are necessary where colour identification is required.

The recommended average illumination values at 3 ft. above floor level for various rooms in the department are as follows:

Accommodation	*Average lumens/sq. ft. recommended*
Laboratories, pathologists', registrar's and head technician's rooms, specimen-cutting room, cytodiagnosis room(s), balance and instrument room, chromatography room, media room, preparation rooms, centrifuge room, metabolic suite, workshop, patients' examination rooms and wash-up	25
Offices and blood donors' room	15
Staff rooms, sterilising room, disposal room, museum and and hot and cold rooms ..	10
Corridors and staircases	10*
Waiting rooms, stores and incinerator room	7*
Photomicrography rooms	5
Cleaners' room and lavatories	5*

* The standard given is required at floor level.

Special lighting

It may be necessary to augment the general lighting directly over work benches in the laboratories and examination rooms by means of adjustable lighting fittings.

Dark room lighting

Normal and safe lighting should be controlled by a master on/off switch located in a position near the door, with a change-over switch arranged so that either the normal or safe lighting is "on". A horizontal cord-pull running across the dark room has been found convenient for controlling the change-over switch.

Where there is no light lock at the entrance to the dark room, indicating lamps arranged in parallel with the safety lights should be provided outside each door giving access to the dark room.

At least one safety light fitting should be wall-mounted to facilitate the viewing of films.

Socket outlets

Sufficient general purpose 13 amp universal switched shuttered outlets on ring or spur circuits should be provided to allow each portable appliance likely to be used at the same time to be connected to a separate outlet.

In main laboratories a socket outlet trunking system is advantageous since it gives maximum flexibility and allows for the repositioning and addition of outlets with minimum disturbance.

Fixed equipment requiring less than 13 amps may be permanently wired from fused spur boxes. Equipment rated in excess of 13 amps should be supplied from separate final sub-circuits and be independently switched. Socket outlets to be used for non-luminous heating appliances, small sterilisers, etc., should be fitted with a neon type indicating light to show when they are in use.

The following socket outlet distribution is suggested:

Laboratories	Trunking system.
Pathologists' rooms	1 twin outlet.
Offices (including records and specimen receiving)	1 twin outlet.
Examination rooms	2 twin outlets.
Staff room	1 twin outlet.
Dark room	2 twin outlets.
Waiting spaces, corridors, etc.	Sockets to be provided to allow for the convenient use of domestic appliances having flexible leads, assumed to be not more than 30 ft. long.

Telephones

Telephones from the hospital system should be provided in the offices and the main laboratories.

Electric clocks

Electric clocks will be required in the laboratories and staff room. Where there is a central clock system this should be extended. In other instances synchronous mains operated clocks should be provided; those in laboratory areas may have a sweep-second hand.

Staff location system

The hospital staff location system may be extended to a central position in the department.

APPENDIX

Recommended areas

Accommodation	*Department serving about 600–800 acute beds*	*Department serving about 400 acute beds*	*Example of a shared service provided at two hospitals, together totalling about 800 acute beds*	
			Hospital "A" specialising in morbid anatomy, morbid histology and haematology	*Hospital "B" specialising in chemical pathology and microbiology*
	sq. ft.	sq. ft.	sq. ft.	sq. ft.
(*a*) *Entrance*				
(i) Patients' waiting room	300	200	200	200
(ii) Patients' lavatories	100	100	100	100
(iii) Patients' examination rooms ..	330	220	220	220
(iv) Clerical suite	650	320	320	320
(*b*) *Administration*				
(i) Pathologists' rooms	4×260	4×260	2×260	2×260
(ii) Registrar's room	160	140	140	140
(iii) Head technician's room	120	120	120	120
(*c*) *Morbid anatomy and morbid histology division*				
(i) General laboratory	600	400	600	140
(ii) Specimen-cutting room	180	140	180	—
(iii) Cytodiagnosis room(s)	2×140	160	2×140	—
(*d*) *Chemical pathology division*				
(i) General laboratory	720	600	140	720
(ii) Balance and instrument room ..	200	100	—	200
(iii) Chromatography room	140	140	—	140
(*e*) *Haematology division*				
(i) General laboratory	450	450	450	140
(ii) Transfusion laboratory	250	140	250	—
(iii) Blood bank	60	40	40	40
(*f*) *Microbiology division*				
(i) General laboratory	600	480	140	600
(ii) Virology laboratory	220	140	—	220
(iii) Serology laboratory	160	160	—	160
(iv) Media room	300	180	140	300
(v) Sterilising room	160	120	80	160
(vi) Plate preparation room	80	80	80	80
(*g*) *Service room*				
(i) Outfit preparation room	140	140	140	140
(ii) Centrifuge room	120	120	120	120
(iii) Workshop	160	100	100	100
(iv) Disposal room	80	60	60	60
(v) Stores	600	450	450	450
(vi) Wash-up	250	140	140	250
(*h*) *Staff rooms*				
(i) Refreshment and rest room.. ..	—	—	—	—
(ii) Tea pantry	60	60	60	60
(iii) Cloakrooms and lavatories	—	—	—	—
(*i*) *Cleaners' room*	50	50	50	50

Circulation space is not included in the above areas.

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